

WHAT I CLAIM IS:

1. An insulin regulator construct, comprising:
 - a) a glucose response element (GIRE) of a liver-pyruvate (L-PK) gene promoter; and
 - b) an insulin-sensitive element of an insulin-like growth factor binding protein-1 (IGFBP-1) basal promoter.
2. The insulin regulator construct of Claim 1, wherein:

said glucose response element comprises a hepatic nuclear factor-4 (HNF-4) binding site and a glucose responsive site.
3. The insulin regulator construct of Claim 2, further comprising:

a plurality of said glucose response elements.
4. The insulin regulator construct of Claim 2, wherein:

the sequence of said HNF-4 binding site and said glucose responsive site is in a native orientation.
5. The insulin regulator construct of Claim 2, wherein:

the sequence of said HNF-4 binding site and said glucose responsive site is reversed from a native orientation.


6. The insulin regulator construct of Claim 1, wherein:

said glucose response element is inserted upstream of
said insulin-sensitive element in an insulin-like growth factor
binding protein-1 (IGFBP-1) basal promoter.
7. The insulin regulator construct of Claim 1, wherein:

said glucose response element comprises a nucleotide
sequence set forth in SEQ ID NO.: 1.
8. The insulin regulator construct of Claim 1, wherein:

said insulin-sensitive element comprises a nucleotide
sequence set forth in SEQ ID NO.: 2.
9. An insulin regulator construct, comprising:

a nucleotide sequence set forth in one of SEQ ID NO.: 3,
SEQ ID NO.: 4, SEQ ID NO.: 5, and SEQ ID NO.: 6.
10. The insulin regulator construct of Claim 1, which is not stimulated
by exposure to lactate or fructose.

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11. The insulin regulator construct of Claim 1, which is stimulated by exposure to glucose and inhibited by exposure to insulin.
 12. A vector comprising the construct of Claim 1.
 13. An adenoviral vector comprising the construct of Claim 1.
 14. A transgene comprising the construct of Claim 1.
 15. A pharmaceutical composition comprising the construct of Claim 1 and a pharmaceutically acceptable carrier or diluent.
 16. A pharmaceutically acceptable derivative of the construct of Claim 1.
 17. A method of treating or preventing diabetic conditions in a subject by administering an effective amount of the construct of Claim 1.
 18. A method of regulating insulin production in a subject by administering an effective amount of the construct of Claim 1.

19. A method of modulating hyperglycemia, while avoiding severe hypoglycemia, in a subject by administering an effective amount of the construct of Claim 1.
20. A method of increasing fat catabolism in a subject by administering an effective amount of the construct of Claim 1.
21. A method of reducing protein catabolism in a subject by administering an effective amount of the construct of Claim 1.